SALMONELLA TYPHIMURIUM FECAL SHEEDING FOLLOWING SALMONELLA CHOLERAESUIS-TYPHIMURIUM VACCINATION VIA DRINKING WATER AND SUBSEQUENT CHALLENGE

Quynn Steichen[1], Rex Smiley[2], Brian Fergen[2], Dianna Jordan[2], Kelly Lechtenberg[3], Troy Kaiser[2], Jessica Seate[2], Petra Maass[4]

[1]Kansas State University, USA
[2]Boehringer Ingelheim Vetmedica, Inc., USA
[3]Midwest Veterinary Services, USA
[4]Boehringer Ingelheim Vetmedica GmbH, Germany

Introduction

Salmonella typhimurium (ST) is a primary cause of enteritis and subclinical production losses in growing or finishing swine. Due to the zoonotic potential, intervention programs for ST have been established attempting to reduce carcass contamination. The objective of this study was to evaluate Salmonella fecal shedding of pigs vaccinated with a commercial, avirulent live culture (ALC) Salmonella Choleraesuis-Typhimurium vaccine when challenged with virulent ST.

Materials and methods

Eight litters of two-week-old pigs were blocked by litter and 3 pigs/litter assigned to treatment groups; ALC vaccine group (n=24) and a placebo group (n=24). Both treatments were administered through the drinking water. Pigs were housed by treatment during the vaccination phase to avoid unintentional exposure of ALC vaccine to the placebo group and were re-penned individually with treatments comingled in the same room for the challenge phase. Four weeks after treatment, all pigs were challenged intranasally with 2mL of virulent ST (4x108 CFU/dose). Fecal samples were collected daily for 14 days post-challenge (DPC) then three times weekly until 84DPC. Fecal samples were tested via modified enrichment culture (lower detection limit ~4000CFU/gram).

Results

During the 12-week challenge phase, the mean number of positive samples/pig was 26.2 (placebo) and 15.9 (vaccine) which was a significant improvement. All placebo pigs were positive from 3DPC to 6DPC, and ≥78.3% of placebo pigs continued to shed until 31DPC; then at least 47.8% of placebo pigs shed from 33DPC to 49DPC. For Vaccine pigs, 82.6% were positive the day after challenge which steadily declined to ≤13.0% from 47DPC through the end of the study.

Discussion

The vaccine group had significantly reduced shedding within two to six weeks post-challenge while several pigs in the placebo group continually shed through the challenge phase. Preliminary data suggests that the use of an ALC Salmonella Choleraesuis-Typhimurium vaccine clinically reduces fecal shedding in pigs post-challenge.